

What is claimed is:

1. A method of preparing a polymer containing low residual monomer levels, comprising:
 - (i) preparing an emulsion polymer having one or more modes, and containing residual monomer;
 - (ii) providing a heat exchanger having a process side and a cooling side;
 - (iii) flowing at least a portion of said emulsion polymer through said process side of said heat exchanger;
 - (iv) initiating the polymerization of said residual monomer by simultaneously feeding an oxidizing agent and a reducing agent to different locations on said process side of said heat exchanger; and
 - (v) completing said polymerization reaction to produce an emulsion polymer having a reduced residual monomer level.
2. The method according to claim 1, wherein said emulsion polymer is prepared by a process selected from the group consisting of a batch process, and a semi-continuous process.
3. The method according to claim 1, wherein said heat exchanger is located in a location selected from the group consisting of a reactor recycle line, and a reactor discharge line.
4. The method according to claim 1, wherein said heat exchanger is a plate and frame heat exchanger.
5. The method according to claim 1, wherein said oxidizing agent is fed to the inlet of the process side of said heat exchanger, and said reducing agent is fed to the outlet of the process side of said heat exchanger.

6. The method according to claim 1, wherein said reducing agent is fed to the inlet of the process side of said heat exchanger, and said oxidizing agent is fed to the outlet of the process side of said heat exchanger
7. The method according to claim 1, wherein up to 99.5% of said residual monomer is reacted to form said emulsion polymer.
8. The method according to claim 1, wherein said completion of said polymerization reaction is performed in at least one separate vessel.
9. The method according to claim 1, wherein from 35% to 90% by weight of said reducing agent and from 35% to 90% by weight of said oxidizing agent are added to at least one separate vessel.
10. The method according to claim 1, wherein said heat exchanger is located in a first reactor discharge stream;
wherein said portion of said emulsion polymer flows through the process side of said heat exchanger in said first reactor discharge stream; and
wherein a different portion of said emulsion polymer flows through at least one second reactor discharge stream, said at least one second reactor discharge stream optionally containing a different heat exchanger.